

PARTICLE ACCELERATION IN SN1006 SHOCK WAVES

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Final Report

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The FUSE data have been reduced, and a paper on the results is in progress. The main results have been presented in a poster at the January 2004 AAS meeting (Korreck et al. 2004a) and an ApJ paper in press (Korreck et al. 2004b).

The primary result is that the widths of the O VI lines in the NW filament are a bit less than the width expected if the oxygen kinetic temperature is 16 times the proton temperature (mass proportional heating). This is at variance with measurements of shocks in the heliosphere, where preferential heating of oxygen and other heavy species is observed. The paper discusses the theoretical implications for collisionless shock wave physics.

A secondary result is that no O VI emission was observed from the NE filament. While the very different particle distribution in that region can partially account for the weakness of the O VI lines, the simplest interpretation is that the pre-shock density in the NE is less than 0.22 times the density in the NW.

The grant has partly supported a graduate student, Kelly Korreck, and it has covered travel to the AAS meeting in January 2004 and the IAU meeting in July 2003.

References:

Korreck, K.E., Raymond, J.C., and Zurbuchen, T. 2004a, Bulletin of the AAS, 35, 1265.

Korreck, K.E., Raymond, J.C., and Zurbuchen, T. and Ghavamian, P. 2004b, ApJ, in press.